

Appendix A provides the "Version with Markings to Show Changes Made." All pending claims are provided in Appendix B for the Examiner's convenience.

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1. (twice amended) An isolated nucleic acid encoding a polypeptide monomer of a pH sensitive potassium channel, the monomer:

(i) forming a potassium channel having a unit conductance of approximately 80-120 pS and having increased potassium channel current activity above approximately intracellular pH of 7.1, when the monomer is expressed in a *Xenopus* oocyte; and

(ii) specifically binding to polyclonal antibodies generated against an amino acid sequence of SEQ ID NO:1, SEQ ID NO:16, or SEQ ID NO:18.

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6. (twice amended) An isolated nucleic acid of claim 1, wherein the nucleic acid selectively hybridizes under moderate stringency hybridization conditions to a nucleic acid comprising a nucleotide sequence of SEQ ID NO:2, wherein the hybridization reaction is incubated at 37°C in a solution comprising 40% formamide, 1 M NaCl, and 1% SDS and washed at 45°C in a solution comprising 1x SSC.

7. (twice amended) An isolated nucleic acid of claim 1, wherein the nucleic acid selectively hybridizes under moderate stringency hybridization conditions to a nucleic acid comprising a nucleotide sequence of SEQ ID NO:17, or SEQ ID NO:19, wherein the hybridization reaction is incubated at 37°C in a solution comprising 40% formamide, 1 M NaCl, and 1% SDS and washed at 45°C in a solution comprising 1x SSC.

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9. (once amended) An isolated nucleic acid sequence of claim 1, wherein the nucleic acid has a nucleotide sequence of SEQ ID NO:17, or SEQ ID NO:19.

10. (once amended) An isolated nucleic acid of claim 1, wherein the nucleic acid is amplified by primers that selectively hybridize under stringent hybridization conditions to the same sequence as the primer sets selected from the group consisting of:

CTCGAACTCCCTAAAATCTTACAGAT (SEQ ID NO:8) and
TTCCGTTGAGCCAGGGGTCACCAGAATT (SEQ ID NO:9);
TCTGCTTTGTGAAGCTAAATCT (SEQ ID NO:10) and
TTTCAAAGCCTGTTTAGCGGTAA (SEQ ID NO:11); and
TTATGCCTGGATCTGCACTCTACATG (SEQ ID NO:12) and
ATAGTTTCCGTCTACTACCGAAA (SEQ ID NO:13);

wherein the amplification reaction comprises an annealing temperature of 50°C for 30 seconds and an extension time of 30 seconds at 72°C for 40 cycles.

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cont
11. (once amended) An isolated nucleic acid of claim 1, wherein the nucleic acid is amplified by primers that selectively hybridize under stringent hybridization conditions to the same sequence as the primer sets selected from the group consisting of:

GGCAGCGCTCATTCTTTCCTCCTT (SEQ ID NO:14) and
TGCCCAAACCTCAACCCAAAATA (SEQ ID NO:15);

wherein the amplification reaction comprises an annealing temperature of 50°C for 30 seconds and an extension time of 30 seconds at 72°C for 40 cycles.

14. (twice amended) An isolated nucleic acid encoding a polypeptide monomer of a pH sensitive potassium channel, the monomer:

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(i) having a core domain that has greater than 60% amino acid sequence identity to amino acids 35-641 of SEQ ID NO:1 as measured using a sequence comparison algorithm; and

(ii) forming potassium channel having a unit conductance of approximately 80-120 pS; and having increased potassium channel current activity above approximately intracellular pH of 7.1, when the monomer is expressed in a *Xenopus* oocyte.

C5 15. (once amended) An isolated nucleic acid of claim 14, wherein the nucleic acid encodes a sequence of SEQ ID NO:1.

16. (once amended) An isolated nucleic acid of claim 14, wherein the nucleic acid encodes a sequence of SEQ ID NO:16 or SEQ ID NO:18.

C6 26. (twice amended) An expression vector comprising a nucleic acid of claim 1.

C7 45. (once amended) The nucleic acid of claim 1, wherein the nucleic acid encodes a polypeptide monomer having a calculated molecular weight of between 120-156 kDa, the molecular weight calculated from amino acid sequence.

48. (once amended) An isolated nucleic acid encoding a polypeptide monomer of a pH sensitive potassium channel, the monomer:

C8 forming a potassium channel having a unit conductance of approximately 80-120 pS and having increased potassium channel current activity above approximately intracellular pH of 7.1, when the monomer is expressed in a *Xenopus* oocyte; wherein said nucleic acid selectively hybridizes under highly stringent hybridization conditions to a nucleic acid comprising a nucleotide sequence of SEQ ID NO:2, SEQ ID NO:17, or SEQ ID NO:19, wherein the hybridization reaction is incubated at 42°C in a solution comprising 50% formamide, 5x SSC, and 1% SDS and washed at 65°C in a solution comprising 0.2x SSC and 0.1% SDS.